

Proposal

Identification of Key Restoration Areas in the Darby-Cobbs Watershed through the use of Watershed Sediment Assessment

Background

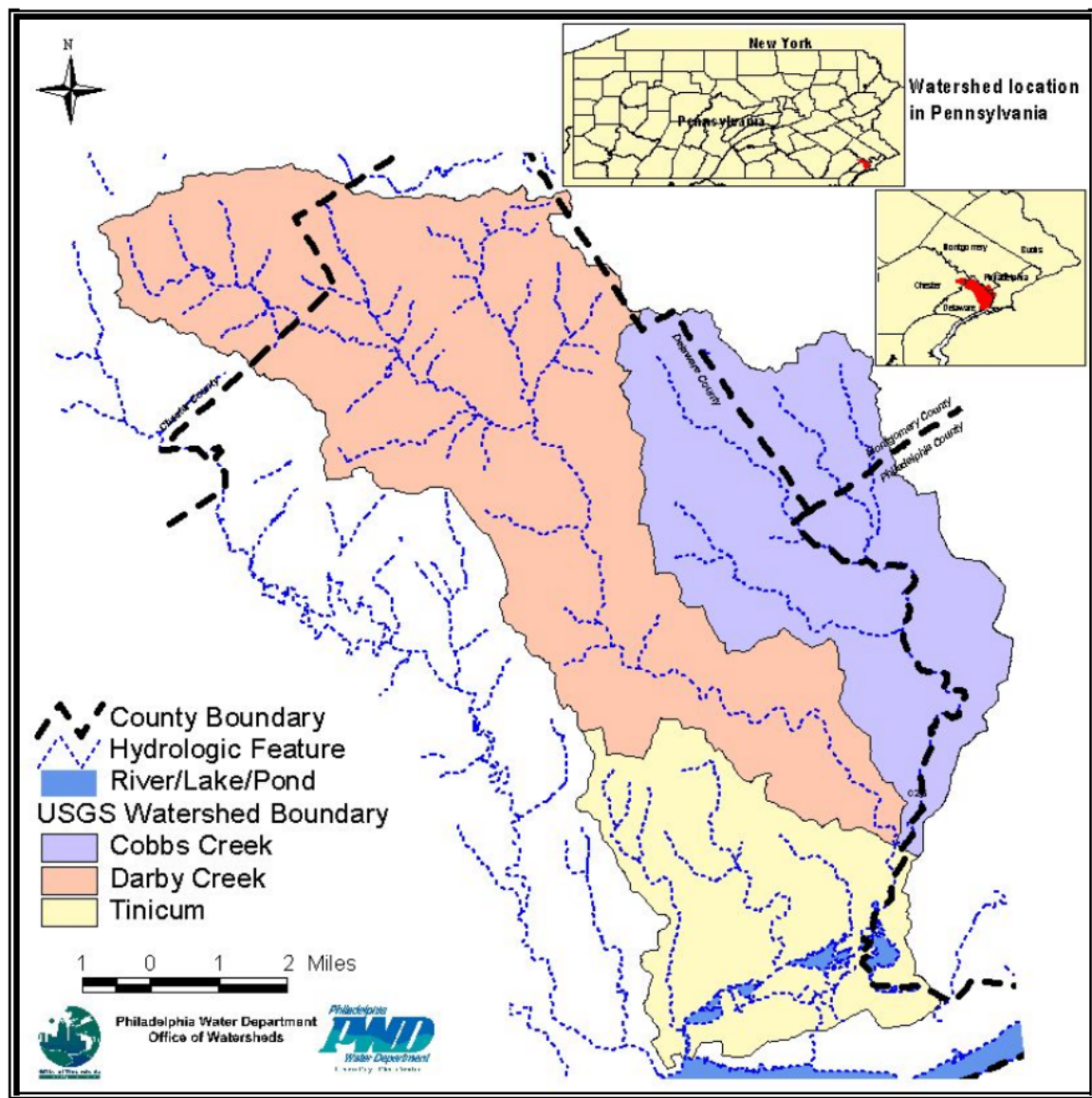
The Darby-Cobbs watershed discharges to the Delaware River through the wetlands of the John Heinz National Wildlife Refuge at Tinicum. The watershed encompasses approximately 80 mi² of southeastern Pennsylvania, including parts of Chester, Delaware, Montgomery, and Philadelphia Counties, and can be divided into three subwatersheds: Cobbs Creek, Darby Creek, and Tinicum (Figure 1). Most of the Darby-Cobbs watershed is highly urbanized and as much as 66% of the surfaces are impervious.

The streams and creeks within the watershed have been a consistent problem in terms of flooding, streambank erosion, ecological degradation, and aesthetics. The Philadelphia District began studying this watershed in 1970 and has initiated 16 official projects over the past 35 years. Only one of these projects, gabion streambank reinforcement, was constructed. Most of these projects were initiated by individual municipalities and were terminated because it was not economically feasible to armor relatively small sections of streambank. In some cases, the high cost of traditional Corps solutions, such as levees and dams, were too expensive for the municipalities. Many of these towns took it upon themselves to channelize and armor most of the streams and creeks, which effectively unbalanced the sediment equilibrium of the watershed, causing more problems, such as excessive sediment or erosion. Urban sprawl and the corresponding increased runoff have further compounded the problem.

Currently, there are six active studies, four stream restoration projects implemented through the Southeastern PA Environmental Improvement Program, a Section 206 CAP project in Darby Creek and the Mid-Delaware River Basin GI Study. In addition, the Philadelphia District received 34 separate project requests from communities within the Darby-Cobbs watershed in the past six months, due in part to recent floods. These potential projects include flood mitigation, exposed sewage infrastructure along streambanks, stream restoration, riparian buffer and streambank restoration, floodplain restoration, and dam modification or removal.

The traditional strategy of proceeding with projects from a municipality-based scale has not been effective. In order to develop an effective strategy, the problems described above need to be examined from a watershed perspective, as most, if not all, of them are a result of imbalances in the sediment equilibrium. Key restoration areas should be identified and projects should be initiated. These projects could be co-sponsored by several adjacent municipalities since the benefits of an effective stream restoration project will positively impact large portions of the watershed.

A watershed-scale assessment is needed to provide a map of potential imbalances in order to identify effective design or remediation needs. This can be accomplished



by creating and running a sediment assessment model of the Darby-Cobbs watershed. The Engineering Research and Development Center (ERDC) Coastal and Hydraulics Laboratory will assess the watershed with a field investigation. They will examine existing data from the watershed and determine if additional data should be collected. They will then use this information to build the model. This model will be used to identify the areas where restoration will have the most significant benefit to the watershed. The lab will then recommend methods that will effectively restore these key areas.

A comprehensive watershed plan will be written based on the findings and will address bank erosion/sediment deposition, dam/impediment removal, greenways, and riparian buffer re-establishment. The plan will also include advance designs (in-stream structures) for more immediate objectives, such as erosion that is threatening homes and sewage infrastructure.

FY06 Activities

1. Compile existing data
2. Assess the watershed with a field investigation (July 2006)
3. Examine existing data and determine if additional data should be collected
4. Begin data collection (if needed), begin building and running sediment transport model, make restoration recommendations
5. Estimate cost for the completion of the modeling effort

Funding Stream

The total funding for the proposed effort for FY06 is \$30,000, and is detailed in the time and cost estimate provided in Table 1. Products associated with this proposal will be used to improve the design of ongoing projects and select and effectively implement future projects that will restore the Darby-Cobbs watershed.

Table 1. Time and Cost Estimate of the Identification of Key Restoration Areas in the Darby-Cobbs Watershed through the Watershed Sediment Assessment

Task	Resource	Time Required	Cost
Assembly of existing data from the Darby-Cobbs watershed	NAP Special Studies Section	3 weeks labor for 1 person	\$5,000
Initial assessment of the watershed	ERDC's Water Operation Technical Support (WOTS) Program, ERDC Coastal and Hydraulics Laboratory	1 week (Summer 2006)	Free
Project coordination	NAP Special Studies Section, NAP Hydrology, Hydraulics, and Coastal Section	5 weeks labor for 2 people	\$5,000
Begin data collection (by contract if needed), begin sediment transport model, FY06 report	ERDC Coastal and Hydraulics Laboratory	Approximately 5 months labor for 3-4 people	\$20,000
Total to Complete FY06 Effort			\$30,000



